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In the early 1960's, Westminster College adopted a new grading system, with the traditional grade levels of A, B, C, D, and F converted to DN (Distinction), HP (High Pass), P (Pass), and NC (No Credit). NC replaced both D and F of the old system, and grade point averages were abolished, in an effort to encourage students to register in more difficult courses. This study, conducted 4 years after the new grading system was put into effect, sought to determine the number of hours taken and passed, and the number of easy, moderate, and hard courses taken and passed by students under each system. Participating students were the Classes of 1965 (under old grading system), 1967 (4 semesters under each system), and 1969 (under new grading system). With each succeeding class, students attempted more hours per semester, but passed fewer courses under the new system. If the D grades under the old system were not included this result could have been different, since NC includes the traditional D but is not entered into the students' records. The general pattern was that students registered in fewer easy and difficult courses, but took and passed a larger number of moderate courses. This trend would seem to represent changed student perceptions of courses over the years and not a change in registration patterns or a direct influence of the grading systems. (WM)

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REGISTRATION PATTERNS UNDER TWO DIFFERENT GRADING SYSTEMS

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There has long been interest and concern about the justifiability and fairness of grades. Aikins (1968) stated that most grading systems were based upon one or more false assumptions, i.e. grades are objective, and grades motivate students to better achievement. Trow (1968) took an opposing position. He felt that grades induce motivation, but he conceded that it is not the highest or noblest motivation.

Juola (1968) found that a great deal of variation existed among professors in assigning grades across sections and across departments and that there appeared to be no justification for these variations. He felt that one way to make grading rational was to develop a meaningful philosophy toward grading and see to it that this philosophy was conveyed to all the faculty. Gamson (1967) found a difference in the philosophy toward grading between social science professors, who apparently gave grades for reward value, and natural science professors who used grades both as reward and punishment.

It was Seawall's (1967) contention that replacing grades with a ranking system would tend to deemphasize grades and, perhaps, develop a spirit of competitiveness among the students.

A Pass-Fail option was seen by Raimi (1967) as possessing the same problems as any other grading system. The teacher

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is still in the position of evaluating the effectiveness of his own teaching, the material is still fragmentary, and there is still a specific time period in which the work must be done.

Yale College adopted a new grading system in 1967 which provides an example of grade levels other than the traditional A, B, C. These grade levels were called "Honors", "High Pass", "Pass", and "Fail".

Some of the things mentioned in the literature, such as using grades as extrinsic motivation and the practice of a certain amount of work done in a specified amount of time for which a grade would be given based upon a sampling of material acquired during that time, were of concern to the faculty of Westminster College in the early 1960's. As a result of this concern, a comprehensive self-study was conducted, and one of the outcomes of this study was the adoption of a new grading system.

There were several features of the new system. Four grade levels were established as follows: DN - Distinction; HP - High Pass; P - Pass; and NC - No Credit. Anything that was clearly judged not of passing quality (work which would have received a D or F under the old system) was given a NC. NC's (No Credits) were not recorded on the students' permanent transcripts. The purpose of this action was to reward success but not penalize failure--in a word, positive reinforcement; and it was hoped that this would encourage the students to restrive and to attempt courses that they would not

have tried under the old grading system when there was a grade-point average to protect. Grade point averages were abolished and students were ranked in their classes according to the number of hours attempted, the number of hours passed, and the new grade levels received in the courses. The standards for each of the grade levels--DN, HP, and P--were to be higher than the standards for the old A, B, C. The grade distributions under both the old and new systems in Table 1 indicate that the standards have, indeed, been raised.

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Insert Table 1 about here
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At the time this study was conducted, the new grading system was in its fourth year. It was felt that this was an appropriate point to ascertain what kinds of changes, if any, had occurred in the registration patterns of the students under the new grading system. Therefore, the specific questions investigated in this study were as follows:

1. Were students attempting more hours under the new grading system than were attempted under the old grading system?

2. Were students passing more hours under the new grading system than students passed under the old grading system?

3. Were fewer "easy" hours and more "moderate" and "hard" hours attempted under the new grading system?

4. Were fewer "easy" hours and more "moderate" and

"hard" hours passed under the new grading system?

Method

The subjects were all the students in the graduating classes of 1965, 1967, and 1969 who were enrolled at Westminster College for the eight semesters of their undergraduate college work. The Class of 1965 was the last class that was evaluated completely by the old grading system, the Class of 1967 was a transition class with four semesters evaluated under each of the systems, and the Class of 1969 was the first class to be evaluated under the new grading system. N's for each of these classes were as follows: Class of 1965 - 82; Class of 1967 - 77; and Class of 1969 - 90.

The number of hours attempted and passed for the eight semesters for each of the students was obtained from student registration cards and permanent records. Since the final semester for the Class of 1969 had not been completed, the number of hours passed for these students was prorated on the past seven semesters' performance.

A basic assumption for this study was that the courses for which students register were somewhat determined by the students' perceptions of those courses. By this, it was meant that students may have preconceived ideas of how easy or hard a course is, and these preconceptions sometimes determine what courses the students elect. Because of this assumption, students were asked to rate courses and/or professors according to their perceptions of the ease or difficulty of obtaining a passing or better grade in the particular courses

or from particular professors. The reasons for the students' feelings about the difficulty level of the courses was not considered to be relevant. The ratings were meant to reflect only the students' perceptions and not the reasons for those perceptions. The ratings were defined as follows:

Easy - students don't have to work awfully hard to get a HP or DN from the professors.

Moderate - it is fairly easy to get a P, but you have to work fairly hard to get a HP or DN.

Hard - students have to work fairly hard to get a P, and very hard to get a HP or DN.

The first ratings were obtained in 1966 from a sample of fifty students randomly selected. Additional ratings were obtained in 1969 from a randomly selected sample of twenty seniors to ascertain if the previous ratings were still valid and to secure ratings for professors who had joined the faculty in the past three years.

Based upon the course ratings, the courses attempted and passed by each student were categorized according to the designated ratings and summed and a total number of hours for each rating was obtained both under the old and new grading systems. These totals, then, were the raw data used in the comparison of easy, moderate, and hard hours attempted and passed.

The different grading systems as represented by the three graduating classes in the study were viewed as different treatments. Thus, the three treatment variables were

identified as Old, Old/New, and New, meaning the old grading system, the transition period of half old, half new, and the new grading system.

Two chi square tests for significance were performed to ensure that the unequal N's and differences in academic ability did not unduly affect the different treatments. Neither of the chi square values was significant indicating that although the N's for the three groups were unequal, they were proportional, and indicating that there were no significant differences in academic ability between the three groups.

Two one-way analyses of variance were performed--one to test for significant difference between mean number of hours attempted under the three treatments and the other to test for significant difference between mean number of hours passed under the three systems. In addition, two two-way analyses of variance were executed--the first to test for significant differences between means of easy, moderate, and hard hours attempted under each of the grading systems, and the second to test for significant differences between means of easy, moderate, and hard hours passed for each treatment. In the event that significant F-ratios were found, separate t-tests were executed to identify specifically where the significant differences occurred.

Results

The result of the one-way analysis of variance which compared the mean number of hours attempted in the treatment years is presented in Table 2. It can be observed that a

significant F-ratio was obtained.

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Table 3 presents the results of the t-tests in which the mean number of hours attempted for each of the treatment groups were compared with each other.

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It will be observed that there was a significant increase in the mean number of hours attempted with each succeeding treatment group, i.e., the Class of 1967, which spent two years under each grading system, attempted significantly more hours than did the Class of 1965. Likewise, the Class of 1969, which spent its four years under the new grading system, attempted significantly more hours than did either the Class of 1965 or 1967.

Thus, it would appear that an affirmative answer would be appropriate for the first question, as the data indicate that students have attempted more hours under the new grading system.

The significant F-ratio shown in Table 4 indicates that there were significant differences among the means of the hours passed for the three treatment groups.

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Insert Table 4 about here
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Presented in Table 5 are the results of the individual t-tests which tested for significant differences between the

means for each of the three groups on the number of hours passed.

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It can be seen that the students who were evaluated by the old grading system passed significantly more hours than did either of the other two groups of students. There was not a significant difference between the Class of 1967 (Old/New) and the Class of 1969 (New) in mean number of hours passed.

It would appear that the question concerning the number of hours passed would be answered in the negative since the data reveal that a higher mean number of hours was passed under the old grading system than under the new grading system as might have been expected.

Table 6 presents the analysis of the mean number of easy, moderate, and hard hours attempted times the three treatments.

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Insert Table 6 about here
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It appears in Table 6 that when the two variables were taken together, the difficulty level of courses did affect the mean number of hours attempted while the grading system or treatment did not. The significant interaction between the two variables suggested that the extent and direction of effect upon hours attempted differed for different levels of difficulty by grading system.

The results of the individual t-tests for significance of differences between mean number of hours attempted by treatment and difficulty of the course are presented in Table 7.

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The data indicate that there were significantly fewer easy hours and significantly more moderate hours attempted under the new grading system than were attempted under the old system. The class representing the half old, half new treatment attempted more hard hours than either of the classes which were exclusively under one or the other of the systems. No significant difference was found between the mean number of hard hours attempted by the students representing the old system and the students representing the new system.

Table 8 presents the analysis of the mean number of easy, moderate, and hard hours passed for each of the three treatments.

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Insert Table 8 about here
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It should be observed that the results are similar to those shown in Table 6, in that the difficulty level of courses apparently did affect the mean number of hours passed, but the treatment or grading system appeared to have little or no effect. The significant interaction would seem to indicate that the extent and direction of effect upon

hours passed differed for different levels of difficulty for each grading system.

The results of the individual comparisons of mean number of hours passed in each category of difficulty level and for each treatment are presented in Table 9.

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The data indicate that under the new grading system, significantly fewer easy hours, significantly more moderate hours, and significantly fewer hard hours were passed than were passed under the old grading system.

Thus, in terms of questions 3 and 4, it was found that, indeed, fewer easy hours and more moderate hours were attempted and passed under the new grading system, but fewer, rather than more, hard hours were attempted and passed under the new grading system.

Discussion

The study of registration patterns of Westminster College students under both the old and new grading systems indicated that there was an increase in the number of hours attempted by the students under the new grading system. This may indicate that the students felt more free under the new system to try their wings, so to speak, particularly since the penalty of failure and anxiety about a grade-point average have been removed. It may be that the students took the view that they might as well try since they had nothing to lose if they didn't make it.

When the number of hours passed was examined, it was found that the trend was reversed, in that the Class of 1965 which had spent its entire four years under the old grading system passed a significantly higher mean number of hours than the Class of 1969 under the new grading system. This was contrary to expectations, since the percentage of DN, HP, and P's were about the same as for the old A, B, C's, and one would assume that if the students were attempting more hours they would probably pass more hours.

There is one fact that should be kept in mind when interpreting the significance of the number of hours passed. Under the old grading system, D's were counted as passing grades. Under the new grading system, there was no D grade--the No Credit encompassed both the old D and F. The mean number of hours passed under the old grading system was 125.57 for the eight semesters. If the hours which received D grades under the old system had not been included as passing grades, the mean number of hours passed under the old grading system would have been 115.16 for the eight semesters. This is enough difference from the mean number of hours passed under the new grading system of 122.22, that if a comparison were done between the corrected mean number of hours passed under the old system, and the mean number of hours passed under the new system, a significantly greater number of hours would have been passed under the new system. It is felt that this qualification should be observed when interpreting the data.

When registration in easy, moderate, and hard courses was considered, it was found that significantly fewer easy courses and significantly more moderate courses were attempted and passed under the new grading system. It was also found that significantly fewer hard courses were attempted and passed under the new system. In other words, there was a trend away from registering for easy and hard courses to registering for moderate courses. It was hoped that the new grading system would motivate students to attempt more difficult courses, and the findings of this study would indicate that there has been some movement from easy courses to moderate courses, but not from moderate courses to hard courses.

This movement, however, did not appear to be a direct function of the grading system. The number of courses offered which were rated easy, moderate and hard under each of the grading systems were tabulated and it was found that the ratings of some of the courses changed over the years and the percentages of easy, moderate, and hard courses under the two grading systems were not the same. For example, under the old system, 33% of the courses were rated easy, 39% were rated moderate, and 28% were rated hard. Under the new system, 17% of the courses were rated easy, 56% were rated moderate, and 27% were rated hard. Thus, the move toward registering for fewer easy and hard courses and more moderate courses would appear to be a function of the changes in ratings over the past few years, rather than a function of the grading system per se.

Summary

This study was to investigate changes in registration patterns of students at Westminster College under two different grading systems. The study was concerned with the total number of hours attempted and passed under each system, and the number of easy, moderate, and hard hours attempted and passed under each system. It was found that the students had attempted more hours per semester under the new grading system, but had passed fewer hours under the new system. The interpretation, however, of the number of hours passed should be made with the clear understanding of what is meant by hours passed under each of the grading systems. There appears to be a trend in registration away from easy and hard courses, and toward moderate courses. This, however, appears to be due to the fact that the students' perceptions of the courses have changed and thus, changes in course ratings probably account for the registration shifts rather than any real change in the registration patterns of the students.

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Footnotes

[1]The author gratefully acknowledges the assistance and advice of Dr. Richard B. Caple, University of Missouri - Columbia, in the preparation and completion of this manuscript.

Table 1

Grade Distributions for the School Years Ending in 1965, 1966, 1967, and 1968

Year	A	B	C	D & F
1965	13%	30%	38%	19%
	DN	HP	P	NC
1966	7%	26%	47%	18%
1967	8%	22%	53%	16%
1968	8%	21%	53%	18%

Table 2

Comparison of Mean Number of Hours Attempted in the Three Treatment Years

Source	df	MS	F
Betweens	2	1794.51	51.87***
Withins	246	34.61	

***p < .01

Table 3

Comparisons of the Mean Number of Hours Attempted for Each of the Treatment Groups as Compared with Each Other

Mean 1	Mean 2	t
Old - 128.83	O/N - 134.27	6.11****
Old - 128.83	New - 137.93	10.02****
O/N - 134.27	New - 137.93	3.93****

****p < .001

Table 4

Comparison of Mean Number of Hours Passed in the Three Treatment Years

Source	df	MS	F
Betweens	2	360.25	4.45*
Withins	246	80.93	

*p < .05

Table 5

Comparisons of the Mean Number of Hours Passed for Each of the Treatment Groups as Compared with Each Other

Mean 1	Mean 2	t
Old - 125.57	O/N - 121.70	-2.98***
Old - 125.57	New - 122.22	-2.50**
O/N - 121.70	New - 122.22	.34

**p < .02

***p < .01

Table 6

Comparison of Mean Number of Easy, Moderate and Hard Hours Attempted for the Three Treatment Groups

Source	df	MS	F
Level	2	30361.74	121.89***
System	2	596.81	2.40
Interaction	4	14465.99	58.08***
Betweens	8	14972.63	60.11***
Withins	738	249.08	

***p < .01

Table 7

Comparison of Mean Number of Easy, Moderate, and Hard Hours Attempted for Each Treatment Group as Compared with Each Other

Mean 1	Mean 2	t
	Easy Hours	
Old - 39.43	O/N - 43.70	1.88
Old - 39.43	New - 27.05	-5.86****
O/N - 43.70	New - 27.05	-6.99****
	Moderate Hours	
Old - 51.17	O/N - 43.82	-2.94***
Old - 51.17	New - 73.91	9.81****
O/N - 43.82	New - 73.91	15.02****
	Hard Hours	
Old - 38.22	O/N - 46.71	3.26***
Old - 38.22	New - 36.97	- .46
O/N - 46.71	New - 36.97	-3.73****

***p < .01

****p < .001

Table 8

Comparison of Mean Number of Easy, Moderate, and Hard Hours Passed for the Three Treatment Groups

Source	df	MS	F
Level	2	25384.36	106.29***
System	2	125.60	.52
Interaction	4	12330.61	51.63***
Betweens	8	12542.80	52.52***
Withins	738	238.82	

***p < .01

Table 9

Comparison of Mean Number of Easy, Moderate, and Hard Hours Passed for Each Treatment Group as Compared with Each Other

Mean 1	Mean 2	t
	Easy Hours	
Old - 38.96	O/N - 41.38	1.10
Old - 38.96	New - 24.98	-6.92****
O/N - 41.38	New - 24.98	-8.04****
	Moderate Hours	
Old - 50.05	O/N - 39.34	-4.39****
Old - 50.05	New - 66.57	7.12****
O/N - 39.34	New - 66.57	10.76****
	Hard Hours	
Old - 36.66	O/N - 41.01	1.48
Old - 36.66	New - 30.68	-2.20*
O/N - 41.01	New - 30.68	-3.97****

*p < .05

****p < .001